PSYC 51a - STATISTICS
Department of Psychology
Brandeis University
Summer, 2016

Instructor: Jasmine (Hasmik) Boshyan
   Email: jboshyan@brandeis.edu (Preferred)
   Office: Brown 18B
   Phone: (781) 736-3278
Office hours: Mondays and Tuesdays 1:30-3:00pm

Class Day and Time: Mondays, Tuesdays and Thursdays 11:00-1:20 pm
Class Location: Goldfarb Computer Classroom

Course Description:
Statistics is used everywhere – from opinion polls to clinical trials in medicine. It is used to draw conclusions about populations by collecting, summarizing, analyzing, and interpreting numerical information about subjects of interest, and it is used to make decisions that go beyond the observation. This course serves as an introduction to gathering and summarizing numerical information (descriptive statistics) and making decisions that go beyond the cases observed (inferential statistics). Since this is a psychology course, techniques useful in the behavioral sciences will be emphasized. Topics of the course include methods for describing data, normal, t-, $\chi^2$, and F- distributions, hypothesis testing, simple correlation and regression analysis, and analysis of variance (ANOVA). Data and examples from empirical studies will be used to elaborate when an analytic method is appropriate and how the method can help address the research questions or test the research hypotheses. Students will have ample opportunities to practice using each method through take-home assignments, in-class exercises, examinations, and SPSS reports. Students will receive extensive instruction in the use of SPSS.

Learning Goals:
- To know how to describe data
- To understand the key concepts of hypothesis testing and inferential statistics
- To understand the principles related to each of the statistical method covered in this course
- To understand when and why you need to use a particular statistical method
- To know how to set up and do related data analysis in SPSS
- To know how to read and interpret the output of SPSS and how to communicate the results to others

Required Materials:
- Calculator: $10 variety, basic calculations. You will not be allowed to use your smartphone for exams, so be sure to have a simple, stand-alone calculator.
- Statistics software SPSS: Will be available for free from LTS.

Course Requirements:
- Class attendance and participation (10%)
  We will be doing a lot of work in class that cannot be made up. Class attendance is required. Because unforeseen emergencies can prevent your attendance at a class through no fault of
your own, two absences during the course are allowed with no reduction in your grade. Every class will begin with a short Quiz covering the material from the previous class. These Quizzes will not be graded and should be used as study-guides. In addition, we will be doing several in-class activities to practice the material learned during the lecture. Again, these activities will not be graded and should be used as study-guides.

**Chapter homework (HW) assignments (18%)**

For every chapter/topic there will be a short assignment to be turned in. These assignments are due at the beginning of the class. A hard copy must be turned in. The grade range per assignment is 0-2, where 0 means you didn’t submit it, 1 means you made an effort but misunderstood enough material that you should get help, and 2 means you did perfectly or made minor mistakes. *Your submitted answers must reflect your own thoughts, in your own words. Answers that duplicate those of other students will be given 0 credit.*

Because answers will be available immediately in class or right after class, these assignments will NOT be accepted late. You will be allowed to miss two homework assignments during the course. All the tentative due dates are listed below in the schedule. It is your responsibility to check LATTE regularly for changes to the schedule and due dates.

**Six SPSS reports (42%)**

These reports are designed to give you a chance to practice performing the analysis using SPSS and writing up a brief report/description of the data. These reports are due at the beginning of the class. An electronic copy of your SPSS data, syntax and output files should be submitted on LATTE along with a word file with a brief description/report of the results (specific instructions for each report assignment will be given in class). *Your submitted description/report must reflect your own thoughts, in your own words. Answers that duplicate those of other students will be given 0 credit.* Late data analysis assignments will be accepted, but there will be grade penalty by 2 points per each late day. Please see the schedule below for the due dates. It is your responsibility to check LATTE regularly for changes to the schedule and due dates.

**Two Exams (30%)**

There are two exams scheduled, and you can find the dates on the class schedule below. Both exams will consist of multiple-choice questions and short answer questions. Exams will be cumulative, based on the nature of statistics, in which new topic incorporates theory and applied aspects of prior learning. More details will be given in class closer to the day of each exam.

**Grading:**

Your course grade will consist of 1) class participation (10%), 2) homework assignments (18%), 3) SPSS data analysis reports (42%), and 4) two exams (30%). For each component, you will receive a numerical score, then final score will be converted to a letter grade at the end of the course, based on this standard: A+ 97-100; A 93-96; A- 90-92; B+ 87-89; B 83-86; B- 80-82; C+ 77-79; C 73-76; C- 70-72. A blank grading sheet for the course will be provided during the first class so you can track your own progress.

**How to do well in this class:**

- Do not miss any class. If you must miss class, contact me and visit my office hours (or schedule a meeting) and I will give you a short overview.
Preview the lecture notes posted on LATTE and come to class ready to ask questions about reading assigned and lecture slides before each class. Anything from the lecture slides can be on the exam, whereas contents that are in the book but not covered in class will not be covered on exams.

Pick up your homework assignments as soon as they are ready, and go over them thoroughly, using the answers provided in class or on LATTE, to make sure you understand everything. We will go over answers if we have extra time after learning course materials.

Complete all SPSS procedures, and ask questions in class or in office hours if something is not clear. The report format will be explained in class. The exams will contain SPSS material, so working through these reports will definitely help you prepare for the exams.

Practice exams (quizzes) will be provided on LATTE, with answers. The practice exam content is a representative sample of what the real exam will cover, but it may not cover every topic that will be on the real exam. The practice exams are about 1/2 the length of the real exams. A good strategy is to study the book, the notes, the assignments, and do the practice quizzes.

The material based on inferential statistics and performing analyses using SPSS is demanding at first and you may probably have to go over it several times in several different ways before you fully understand it. However, students who do complete all of this work are likely to master the necessary skills and get good grades. You may also find that conducting the analysis is interesting and rewarding.

Do not hesitate to ask for help when you need it. The longer you wait, the more material will accumulate and the harder it will be to master it. If you find yourself not understanding the assigned readings, lectures, or assignments, please set up an appointment with me or drop by during office hours.

Please remember that doing all requirements thoroughly in a timely manner is the key to successfully mastering this course!

Class Policies:

- **Makeup exams** - In emergency cases, only with valid excuses, you may take a makeup exam prior to the scheduled exam day. Valid excuses consist of sickness with a doctor’s note and documented family emergencies.

- **Disability Services** - If you are a student with a documented disability on record at Brandeis University and wish to have reasonable accommodations made for you, please let me know.

- **Academic integrity** - Academic integrity is central to the mission of educational excellence at Brandeis University. Each student is expected to turn in work completed independently, except when assignments specifically authorize collaborative effort. It is not acceptable to use the words or ideas of another person – be it a world-class philosopher or your lab partner – without proper acknowledgement of that source. This means that you must use author citations, endnotes, and, where appropriate, quotation marks to indicate the source of any phrases, sentences, paragraphs, or ideas found in published volumes, on the internet, or created by another student. Violations of University policies on academic integrity, described in Section Three of Rights and Responsibilities, may result in failure in the course or on the assignment, or in
suspension or dismissal from the University. If you are in doubt about the instructions for any assignment in this course, it is your responsibility to ask for clarification.

» Etiquette - Please arrive on time to settle down before class begins and remain until the end. Deactivate your cell phone. Show respect for others and do not engage in activities which will distract our learning.

Student resources:
» Textbook companion site for students: http://www.sagepub.com/field4e/study/default.htm
» For SPSS tutorials and other good stuff see www.youtube.com/user/ProfAndyField
» For SPSS support at Brandeis, refer to http://lts.brandeis.edu/techhelp/content/spss.html
» Good site for revising basic math: http://www.bbc.co.uk/schools/gcsebitesize/maths/
» SPSS statistical software package, Version 23: Accessible on computers in Goldfarb Computer Classroom (26 seats, Goldfarb Library Mezzanine), Farber Computer Classroom (32 seats, Farber Library Level 1), Information Commons (27 seats, Goldfarb Library Level 1), Shapiro Library Cluster (24 seats, Shapiro Campus Center Level 2). SPSS can also be installed on your personal PC or Mac through Brandeis LTS at http://brandeis.onthehub.com. If necessary, you can go to the Help Desk for help with installation.

Comments:
Your comments and suggestions about this course are welcome at any time.
Approximate class/reading/homework schedule *(subject to change)*:

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
<th>HW</th>
<th>SPSS</th>
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<tbody>
<tr>
<td>June 6 (M)</td>
<td>Introduction</td>
<td>Ch1: 1.1-1.5</td>
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<td>June 7 (T)</td>
<td>Frequency distribution Central tendency &amp; variability</td>
<td>Ch1: from 1.6</td>
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<tr>
<td>June 9 (Th)</td>
<td>Populations &amp; Samples SPSS Basics &amp; Graphs</td>
<td>Ch2: 2.1-2.5</td>
<td>HW #1</td>
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<td>June 13 (M)</td>
<td>Hypothesis Testing, Effect Size &amp; Power</td>
<td>Ch2: from 2.6</td>
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<td>SPSS report #1</td>
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<td>June 14 (T)</td>
<td>Z-test &amp; Bias</td>
<td>Ch2 &amp; Ch5</td>
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<td>June 16 (Th)</td>
<td>Review</td>
<td>Ch5</td>
<td>HW #3</td>
<td>SPSS report #2</td>
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<td>June 20 (M)</td>
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<td>June 21 (T)</td>
<td>Correlation Regression</td>
<td>Ch7: 7.1-7.4</td>
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<td>Ch8: 8.1-8.4</td>
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<td>June 23 (Th)</td>
<td>Independent &amp; Related Samples T-test</td>
<td>Ch9</td>
<td>HW #4</td>
<td>SPSS report #3</td>
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<td>June 27 (M)</td>
<td>One-way ANOVA</td>
<td>Ch11</td>
<td>HW #5</td>
<td>SPSS report #4</td>
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<td>June 30 (Th)</td>
<td>Factorial ANOVA</td>
<td>Ch13</td>
<td>HW #6</td>
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<td>Repeated-measures ANOVA</td>
<td>Ch14</td>
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<td>July 5 (T)</td>
<td>Chi-square</td>
<td>Ch18: 18.1-18.5</td>
<td>HW #8</td>
<td>SPSS report #5</td>
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<td>Review</td>
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<td>SPSS report #6</td>
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<td>Brandeis Monday</td>
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<td>July 7(Th)</td>
<td>FINAL EXAM</td>
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**NOTE:** Homework and SPSS reports are listed when they are due.